

REMARKS

In support of Applicant's remarks in this Reply and as a submission of evidence in the present application, Applicant submits concurrently herewith a Declaration of Robert S. Brown Under 37 C.F.R. § 1.132 ("the Declaration"). As indicated at least in paragraphs 1-4 of the Declaration and the documents cited therein, Prof. Brown has extensive experience with the field of mass spectrometry and with practitioners in that field. Accordingly, Applicant respectfully requests that the Examiner consider and give weight to the statements of fact, reasoning and observations of Prof. Brown in the Declaration.

Status of the Claims

Claims 75-98 are pending in the application and stand rejected. Claims 1-74 were previously canceled without prejudice. Accordingly, claims 75-98 remain pending for examination.

Applicant notes that the Office Action does not allege that claims 97-98 are unpatentable under 35 U.S.C. § 112, first paragraph and thus appears to have withdrawn the prior rejection of claims 97-98 under 35 U.S.C. § 112, first paragraph.

Rejections Under 35 U.S.C. § 112, first paragraph

Claims 75-89 and 92-96 are rejected under 35 U.S.C. § 112, first paragraph, as allegedly containing subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In particular, the Office Action asserts that in claims 75, 92 and 95-96 the presence of a sample support holder for multiple sample supports in a lock chamber that does not include a separate sample chamber having the sample support holder therein is not supported in the original specification.

Applicant submits that one of ordinary skill in the art upon reading the application as a whole would have understood that the inventor of the present application had possession of the invention claimed in claims 75-89 and 92-96 because the specification describes a vacuum lock chamber containing a sample support holder adapted to support

more than one sample support. Specifically, the specification at column 9, lines 39-45 states:

[a] tested sample plate may be transported from ion source chamber to a vacant slot in the cassette within the vacuum lock chamber, and the sample cassette indexed to position another sample plate for transport from the vacuum lock chamber to the ion source chamber, then the sample door [is] closed and the new samples on the new plate tested (emphasis added).

The Office Action asserts at page 3 that the above text is “solely directed to the embodiment shown in figure 8,” which includes a separate storage chamber. The Office Action asserts the following as evidence that the above quoted text should be limited to describing only the embodiment of Figure 8,

[r]elative to the description of column 9, lines 39-49, ... a similar description is found in column 7, lines 25-47... While the cited section of column 9 does not teach how samples can be manually added the discussion in column 7 taken in conjunction with it clearly shows how the samples can be manually loaded into the system described in figure 8.

Applicant respectfully submits that even if column 7 can be taken in conjunction with column 9 to describe an embodiment of the invention illustrated in Figure 8, this does not establish that the quoted text at column 9, lines 39-45 is directed solely to the embodiment of Figure 8. The quoted text at column 9, lines 39-45, contains no word or phrase of limitation that restricts its descriptive content solely to the embodiment of Figure 8. Instead, the quoted text at column 9, lines 39-45, contains a broadening phrase. The phrase “may be” in the quoted text indicates that the description which follows describes embodiments that are not directed solely to Figure 8; but rather, the invention as a whole. In addition, as Applicant has stated previously, Applicant’s reading of the quoted text at column 9, lines 39-45 is supported by the fact that the specification extensively and repeatedly uses reference numerals when specifically referring to structure shown in the figures. The above quoted text does not contain any reference numerals and thus, should not be considered specific to any particular figure, but rather as a general description of the invention.

Further, Applicant submits the Declaration as evidence that one of ordinary skill in the art upon reading the application as a whole would have understood that the inventor of

the present application had possession of the invention claimed in claims 75-89 and 92-96. Specifically, in paragraph 14 of the Declaration Prof. Brown states, based on his experience with practitioners in the field, that,

the ordinary practitioner in the field of mass spectrometry would understand that the Vestal application describes systems where a sample support holder can be placed in the vacuum lock chamber even for those systems that do not have a sample storage chamber...[,] understand that such systems are included in the description at column 6, line 50, to column 9, line 51...[and] that methods for obtaining mass data using a sample support holder in the vacuum lock chamber without a sample storage chamber...[are] described by the Vestal application

Applicant respectfully submits that the observations of Prof. Brown, based on his experience and the support for his views found in the present application, should be accorded weight on the issue of what the present application conveys to one of ordinary skill in the art.

Applicant further submits that one of ordinary skill in the art upon reading the application as a whole would have understood that the inventor of the present application had possession of the invention claimed in claims 93 and 95-96 because the specification describes structures and methods that permit the vacuum lock chamber and the ion source chamber to be in fluid communication and under a vacuum controlled environment during disassociation, transportation and association of sample supports. Specifically, the specification at column 9, lines 39-45 states:

[a] tested sample plate may be transported from ion source chamber to a vacant slot in the cassette within the vacuum lock chamber, and the sample cassette indexed to position another sample plate for transport from the vacuum lock chamber to the ion source chamber, **then the sample door [is] closed** and the new samples on the new plate tested (emphasis added).

According to the sequence of events described in the immediately above quoted text, fluid communication exists between the vacuum lock chamber and ion source chamber during the disassociation, transportation and association of first and second sample supports. Subsequent to a second sample support being positioned in the ion source chamber, the sample door positioned between the vacuum lock chamber and the ion source chamber is closed to cut off fluid communication between the vacuum lock

chamber and the ion source chamber. Conversely, when this sample door is open, fluid communication exists between the vacuum lock chamber and the ion source chamber. Thus, the means in claims 95 and 97 and the output port in claims 96 and 98 may be output door 76 and/or 76A or other suitable structure disclosed in the specification, or equivalents thereof.

In addition, Applicant submits the Declaration as evidence that one of ordinary skill in the art upon reading the application as a whole would have understood that the inventor of the present application had possession of the invention claimed in claims 93, 95 and 96. Specifically, in paragraph 14 of the Declaration Prof. Brown states, based on his experience with practitioners in the field, that,

upon reading the Vestal application the ordinary practitioner in the field of mass spectrometry would also understand that the Vestal application describes structures and methods that permit the vacuum lock chamber and the ion source chamber to be in fluid communication and under a vacuum controlled environment during disassociation, transportation and association of sample supports...[and] understand that such systems are included in the description at column 6, line 50, to column 9, line 51 of the Vestal application.

Applicant respectfully submits that the observations of Prof. Brown, based on his experience and the support for his views found in the present application, should be accorded weight on the issue of what the present application conveys to one of ordinary skill in the art.

Finally, the Office Action also alleges a distinction between embodiments of the invention that are manually operated, requiring operator intervention, and embodiments that are fully automatic. However, as Applicant has stated previously, the specification at column 9, lines 45-49, clearly describes that,

[w]hile the mass spectrometer is testing one sample plate, new samples may be manually or automatically loaded and/or tested using sample plates removed without interfering with the mass spectrometer or it [sic] vacuum system (emphasis added).

The quoted text at column 9, lines 45-49, contains the broadening phrases “or” and “and/or” indicating that embodiments of the invention are not necessarily only manual or only automatic, but may be adapted for both types of operation. In addition, the

immediately above quoted text also does not include reference numerals to specific structure depicted in a figure. Thus, the description at column 9, lines 39-49 should be considered to be applicable to the invention as a whole and not any particular figure or mode of operation.

In view of the above, Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 75-89 and 92-96 under 35 U.S.C. § 112, first paragraph. Applicant submits that support for claims 75-89 and 92-96 can be found in the original specification and that one of ordinary skill in the art would have understood that the inventor of the present application had possession of the invention claimed in claims 75-89 and 92-96. In addition to the evidence in the specification itself, Applicant submits the facts, reasoning and observations set forth in the Declaration as evidence that claims 75-89 and 92-96 meet the requirements of 35 U.S.C. § 112, first paragraph.

Rejections Under 35 U.S.C. § 103(a)

Claims 75-81 and 84-98 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 5,288,644 to Beavis et al. ("Beavis") in view of "An Automatic Analytical Laboratory for Mass-Spectrometric Isotopic-Dilution Analysis of Uranium and Plutonium in Fuel Solutions," *Safeguards Tech., Proc. Symp.*, 2, pages 165-176 (1970) by Wilhelmi et al. ("Wilhelmi"); U.S. Patent No. 5,382,793 to Weinberger et al. ("Weinberger"); and "Automated Sample Transport System for Chromatography/Secondary Ion Mass Spectrometry," *Rev. Sci. Instrum.* 60, pages 1071-1074 (1989) by Duffin et al. ("Duffin"). Claim 82 is rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Beavis in view of Wilhelmi, Weinberger and Duffin as applied to claim 81, and further in view of U.S. Patent No. 5,037,611 to Ledford, Jr ("Ledford"). Claim 83 is rejected under 35 U.S.C. § 103 as allegedly being unpatentable over Beavis in view of Wilhelmi, Weinberger and Duffin as applied to claim 75, and further in view of "A direct insertion sample handling system for mass spectrometers," *Int. J. Mass Spectrom. Ion Phys.*, 3, pages 159-160 (1969) by Bakker et al ("Bakker").

The Office Action asserts that Beavis teaches the dissociation and attachment of a sample support to a sample receiving stage, i.e., the top of a cylindrical rod that is the rotating part of a stepper motor. Consequently, the Office Action further asserts that the secondary references need not teach this aspect of the claims as the secondary references

are capable of performing this action by virtue of the sample support being removably attached to the sample support transport mechanism. Applicant respectfully disagrees with these assertions.

First, Applicant's claims require an ion source chamber comprising a sample receiving stage, i.e., the ion source chamber includes (or contains) a sample receiving stage. Second, Applicant's claims require a sample transport mechanism adapted to disassociate a first sample support from the sample receiving stage, transport the first sample support from the ion source chamber through an output port to a vacuum lock chamber and transport a second sample support from the vacuum lock chamber through the output port to the ion source chamber and to associate the second sample support with the sample receiving stage. Beavis does not teach, suggest or motivate any mechanism or means for moving a sample support to an ion source chamber from another chamber and associating the sample support with a sample receiving stage within the ion source chamber. (See also, the Declaration at para. 18). Accordingly, the assertion in the Office action that Beavis teaches the dissociation and attachment of a sample support to a sample receiving stage is incorrect.

Assuming for the sake of argument that the means for dissociation and attachment in Beavis is operator intervention, i.e., manual dissociation and attachment, Beavis would still fail to teach, suggest or motivate any mechanism or means for moving a sample support to an ion source chamber from another chamber and associating the sample support with a sample receiving stage within the ion source chamber. More specifically, the sample receiving stage allegedly disclosed in Beavis is the top of a cylindrical rod that is the rotating part of a stepper motor. If a sample support is placed on the top of the cylindrical rod and moved through a vacuum lock into an ion source chamber, there could be no subsequent association of the sample support with a sample receiving stage in the ion source chamber because the association occurred prior to introduction into the vacuum lock. Alternatively, if the top of the cylindrical rod initially is positioned in the ion source chamber and an operator was to associate a sample support with the top of the cylinder in the ion source chamber, then there would be no need to transport the sample support through an output port from a vacuum lock.

Further, Applicant submits the Declaration, and in the particular the facts, reasoning and observations of paragraphs 17-19, as evidence that Beavis does not describe

a sample transport mechanism adapted to disassociate a first sample support from the sample receiving stage, transport the first sample support from the ion source chamber through an output port to a vacuum lock chamber and transport a second sample support from the vacuum lock chamber through the output port to the ion source chamber and to associate the second sample support with the sample receiving stage. Applicant respectfully submits that the statements of fact, reasoning and observations of Prof. Brown should be accorded weight on the issue of what Beavis describes and conveys to one of ordinary skill in the art.

Therefore, Applicant submits that Beavis does not teach, suggest or motivate any mechanism or means for moving a sample support to an ion source chamber from another chamber and associating the sample support with a sample receiving stage within the ion source chamber.

Applicant further submits that Weinberger, Wilhelmi, and Duffin do not cure the deficiencies of Beavis. As stated previously, Weinberger does not teach, suggest or motivate a transport mechanism that can disassociate, transport and associate sample supports as set forth in Applicant's claims. Although Weinberger illustrates disassociating a sample probe (30, 154) from a sample ring (152) with a push-rod type structure (159), Weinberger's sample probe is not associated with a sample receiving stage in an ion source chamber. (See also, the Declaration at para. 22). Rather, Weinberger's sample probe never leaves the tip of the push-rod until it returns to the sample ring. (See, e.g., Weinberger, Fig. 7 and col. 9, lines 5-17 (indicating that probe remains attached to tip of push-rod entire time probe undergoes irradiation); See also, the Declaration at paras. 22, 23). Accordingly, Weinberger does not teach, suggest or motivate a sample support transport mechanism that is adapted to either "disassociate a ... sample support from [a] sample receiving stage," or "associate ... [a] sample support with [a] sample receiving stage" in an ion source chamber.

Further, Applicant submits the Declaration, and in the particular the facts, reasoning and observations of paragraphs 22-23 and the reasoning therein, as evidence that Weinberger does not describe or suggest a transport mechanism that can disassociate, transport and associate sample supports as set forth in Applicant's claims. Specifically, the Declaration makes clear in paragraph 23 that, "the Weinberger patent does not describe or suggest a structure that enables a sample support to be dissociated from a

transport mechanism and associated with a receiving stage.”

Although Wilhelmi states “[f]rom the lock chamber the individual beads are transported separately by a pinch rod into the ion source for measurement and back to the cassette after measurement,” Wilhelmi does not teach, suggest or motivate a sample support transfer mechanism adapted to associate a sample support with a sample receiving stage in an ion source chamber. (Wilhelmi, page 171, section 4.1). Rather, Figure 3 of Wilhelmi suggests that the sample support remains attached to the push rod. (See also, the Declaration at para. 21). Accordingly, Wilhelmi does not teach, suggest or motivate the sample support transport mechanism required by Applicant’s claims.

Further, Applicant submits the Declaration, and in the particular the facts, reasoning and observations of paragraphs 20-21, as evidence that Wilhelmi does not describe or suggest a transport mechanism that can disassociate, transport and associate sample supports as set forth in Applicant’s claims. For example, the Declaration makes clear in paragraph 21 that, “the Wilhelmi article does not describe or suggest that the sample filament (or bead) is ever detached from the end of the pushrod...during mass spectrometric analysis.”

Applicant submits that Duffin also does not disclose or suggest any form of sample support transport mechanism. Rather, Duffin describes a sample translator. See, e.g., Duffin, Fig. 1 and pages 1072-73. (See also, the Declaration at para. 24). In addition, Applicant submits the Declaration, and in the particular the facts, reasoning and observations of paragraph 24, as evidence that Duffin does not describe or suggest a transport mechanism that can disassociate, transport and associate sample supports as set forth in Applicant’s claims. Moreover, even if Duffin’s sample translator is considered to teach a sample receiving stage, Duffin provides no teaching, suggestion or motivation of any mechanism adapted to disassociate or associate a sample support with a sample receiving stage, or to transport the sample support to a sample receiving stage. Accordingly, Duffin does not teach, suggest or motivate the sample support transport mechanism required by Applicant’s claims.

Further, claims 95-98 require that the vacuum lock chamber and the ion source chamber be in fluid communication and under a vacuum controlled environment during disassociation, transportation and association of the first and second sample supports. Based on the above discussion with respect to Beavis, the dissociation and association of a

sample support holder with the top of a cylindrical rod would be accomplished manually while under ambient pressure, not a vacuum environment. (See also, the Declaration at para. 17). None of Wilhelmi, Weinberger and Duffin cure this deficiency. Accordingly, Beavis, Wilhelmi, Weinberger and Duffin, either alone or in combination, do not teach, suggest or motivate at least that which Applicant recites in the final wherein or means clauses of claims 95-98, and Applicant respectfully requests reconsideration and withdrawal of the rejections to at least these claims.

Furthermore, Applicant submits that to combine two or more of Beavis, Weinberger, Wilhelmi, Duffin, Ledford, and Bakker (collectively "the cited references") to produce one or more of Applicant's would require undue experimentation by one of ordinary skill in the art. Applicant submits the Declaration, and in the particular the facts, reasoning and observations of paragraphs 17-28, as evidence that to combine two or more of the cited references to produce one or more of claims 75-91 and 95-98 would require undue experimentation by one of ordinary skill in the art. Therefore, considered as a whole, claims 75-91 and 95-98 are novel and unobvious over Beavis, Weinberger, Wilhelmi, Duffin, Ledford, and Bakker, either alone or in proper combination, and Applicant respectfully requests reconsideration and withdrawal of this rejection for claims 75-91 and 95-98.

Applicant submits that method claims 92-94 also are unobvious in view of the combination of cited references. Specifically, Beavis, Wilhelmi, Weinberger, and Duffin fail to teach, suggest or motivate a method of obtaining mass data that includes at least the steps of:

- disassociating [a] first sample support from [a] sample receiving stage;
- transporting the first sample support from [an] ion source chamber to [a] vacuum lock chamber;
- associating the first sample support with [a] sample support holder;
- disassociating a second sample support from the sample support holder;
- transporting the second sample support from the vacuum lock chamber to the ion source chamber; [and]
- associating the second sample support with the sample receiving stage.

For the reasons discussed above for the system claims, the cited references fail to teach,

suggest or motivate the sequential steps for disassociating and associating a sample support with a sample receiving stage and a sample support holder as set forth in claims 92-94. In addition, Applicant submits the Declaration, and in the particular the facts, reasoning and observations of paragraphs 17-28, as evidence that to combine two or more of the cited references to produce one or more of claims 92-94 would require undue experimentation by one of ordinary skill in the art. Accordingly, Applicant submits that claims 92-94, considered as a whole, are novel and unobvious over the cited references, either alone or in combination, and Applicant respectfully requests reconsideration and withdrawal of this rejection for claims 92-94.

CONCLUSION

In view of the foregoing, Applicant respectfully submits that claims 75-98 are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephonic interview would serve to clarify issues or expedite the prosecution of the present application, the undersigned attorney would welcome such an opportunity to discuss any outstanding issues and the Examiner is invited to call the undersigned at (508) 416-2472.

Respectfully submitted,
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